

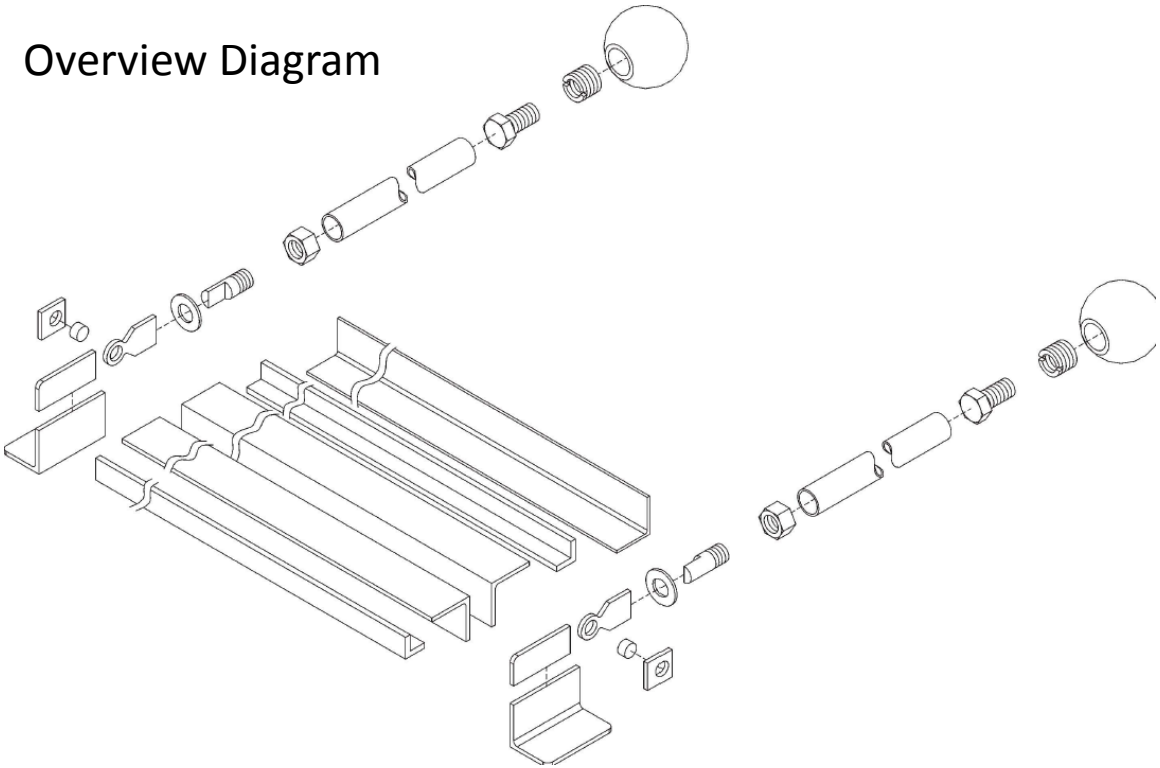
# Miller Welding Project: Bending Brake

Enhance your shop with a new bending brake - and save some money too! The design is solid, yet simple enough for almost anyone to build. As shown, you can clamp the brake to a rolling cart so it can be close to the project at hand. Creation time: approx. 6-8 hrs.

## Materials and Tools:

- 2 feet (60.96 cm) of 3/16 inch (.4762 cm), 1.25 inch (3.175 cm) wide flat stock cut into the following pieces:
  - (2) 3 inch (7.62 cm)
  - (2) 1.25 inch (3.175 cm)
  - (2) 2.625 inch (6.667 cm)
- 2 inches (5.08 cm) of 5/8 inch (1.587 cm) round bar
- 5 feet (152.4 cm) of 2 x 2 x 3/16 inch (5.08 x 5.08 x .4762 cm) angle iron cut into the following pieces:
  - (2) 25 inch (63.5 cm)
  - (2) 3.5 inch (8.89 cm)
- 4 feet (60.96 cm) of 1 x 1 x 1/4 inch (2.54 x 2.54 x .635 cm) angle iron cut into (2) 23 inch (58.42 cm) pieces
- 2 feet (60.96 cm) of 1.75 x 1.75 x 1/8 inch (4.445 x 4.445 x .3175 cm) angle iron
- 2 feet (60.96 cm) of 3/4 inch (1.905 cm), 16 gauge tubing cut into (2) 10 inch (25.4 cm) pieces
- (2) Bolts, 3/4 x 2 inch (1.905 x 5.08 cm)
- (2) Matching Nuts
- (4) Matching Flat Washers
- (2) Matching I.D. Rubber Handles or Ends
- 4 1/2 inch (11.43 cm) grinder
- Drill or drill press
- 5/8 inch (1.587 cm) drill bit
- Minimum of 4 clamps
- Ruler
- Spectrum Plasma Cutter, Horizontal band saw ( or cutoff wheel in your grinder)
- Millermatic MIG Welder
- Arc Armor Helmet & Safety Apparel

## Overview Diagram

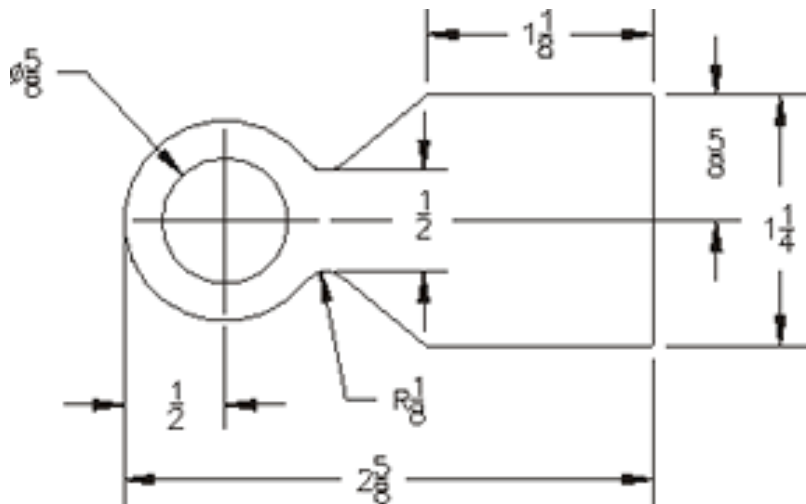


- 1 In both of the 1.25 x 1.25 inch (3.175 x 3.175 cm) pieces of 3/16 inch (0.4762 cm) flat stock, drill a 5/8 diameter hole .500 from one end in the center of the piece.

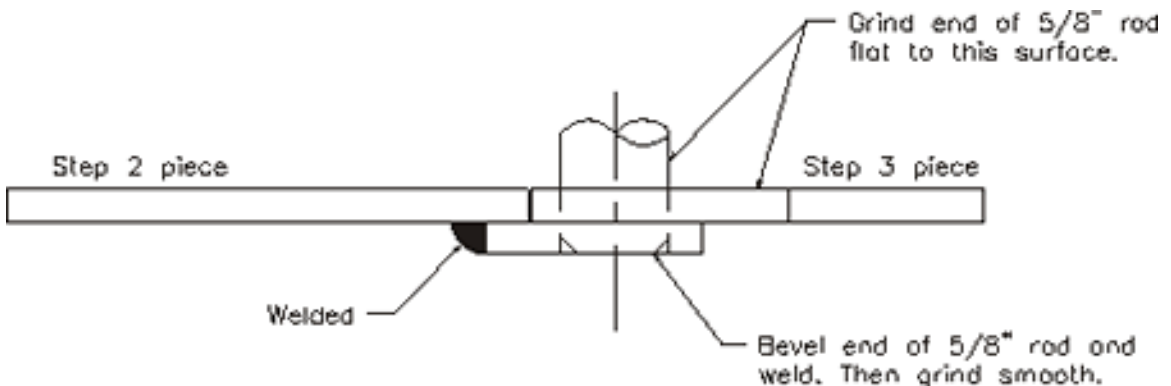


- 2 Overlap the 1.25 x 1.25 inch (3.175 x 3.175 cm) piece with the hole in it onto the 3 inch (7.62 cm) piece of 3/16 inch (0.4762 cm) flat stock by 0.250 inches (0.635 cm) and weld together. Make sure you weld only the side where the small piece overlaps the longer one.

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- 3 Drill a hole in the 2.625 inch (6.667 cm) pieces of  $\frac{3}{16}$  inch (.4762 cm) flat stock .500 inch from one end in the center of the piece. Grind the end around the hole so there is  $\frac{3}{16}$  inch (.4762 cm) of material all the way around leaving about  $\frac{1}{2}$  inch (1.27 cm) in the center of the piece.

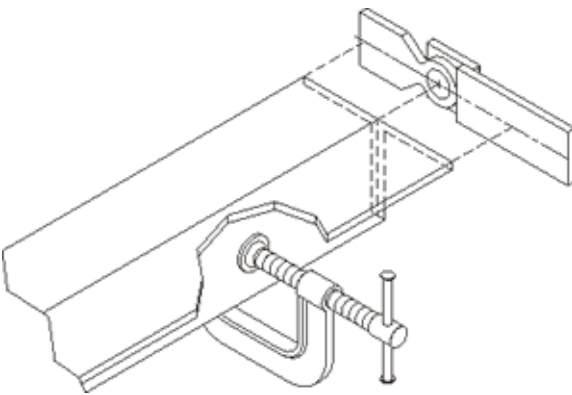


- 4 After this is done, see that the two pieces mate up and the holes align with each other. If not, you can grind some material out of the two welded pieces. Don't grind the single piece to less than  $\frac{3}{16}$  inch (.4762 cm). Place one of the 5.8 inch (1.587 cm) round pieces into the holes and rotate the hinge to make sure it works. Make any adjustments at this time.

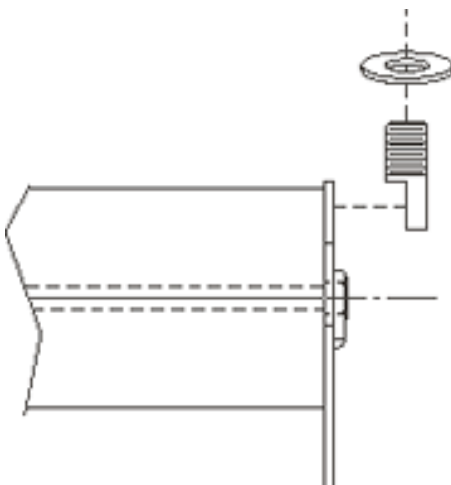
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- 5** Bevel one end of the 5.8 inch (14.73 cm) rod, line up both pieces and push it through. You should be able to rotate the two assemblies. The beveled end will be on the 1.25 x 1.25 inch (3.175 x 3.175 cm) piece, push it flush and weld, filling in where the bevel is. Grind the other side of the hinge.

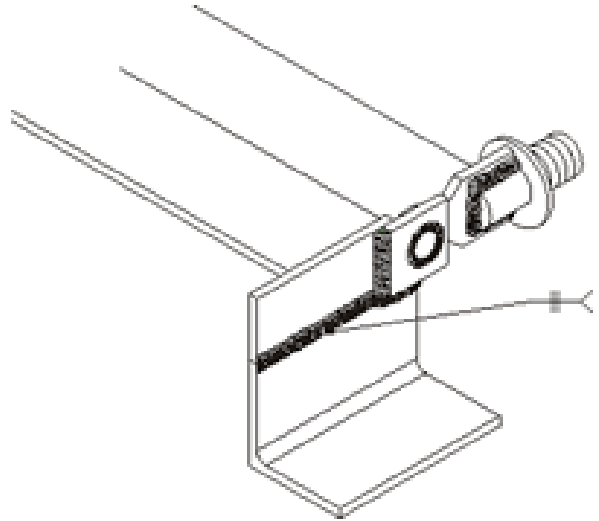


- 6** Clamp the two pieces of 25 inch (63.5 cm) x 2 x 2 x 3/16 inch (5.08 x 5.08 x .4762 cm) angle together, center where they come together with the center of the 5/8 inch (1.587 cm) rod and weld to each hinge. The top of the two pieces should be centered top to bottom on the two hinges.

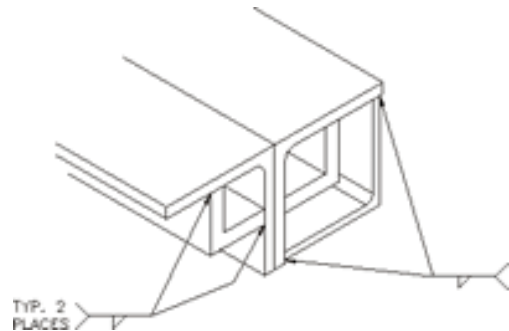


- 7** Cut the head from the 2 x 3/4 inch (5.08 x 1.905 cm) bolts, grind half way through the bolt about half way up the bolt and weld to the bending side of the hinge. (The piece that does not have the 5/8 inch (1.587 cm) rod welded to it.)

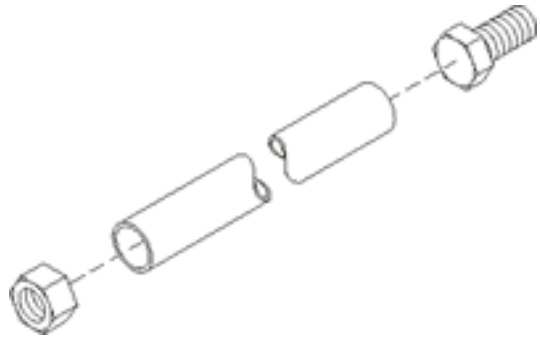
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- 8 Weld the two 3.5 inch (8.89 cm) long pieces of 2 x 2 x 3/16 inch (5.08 x 5.08 x .4762 cm) angle to the bottom of the other side of the hinge on both sides. This will be the base to clamp the brake to a table.



- 9 Weld the bracing underneath the platens, the 1 x .25 inch (2.54 x .635 cm) angle will be on both sides and the 1.75 x 1/8 inch (4.445 x .3175 cm) angle is only underneath the bending platen, on top of the 1 x .25 inch (2.54 x .635 cm). Use as many clamps as you can while welding these in place.



**10** If you want, place the table right side up and fully extend the legs on a hard flat surface. Scribe the legs to the hard flat surface and cut with a 4 1/2 inch (11.43 cm) cut off wheel.

**11** You will need to make dies of various lengths to place on what you are bending. Clamp down with a couple of "C" clamps and bend.

**12** Brush any exposed welds smooth and paint if desired.



### **WARNING**

Safety is the primary concern on any project. Always use tools and equipment in accordance with the manufacturer's instructions. For Miller products, refer to your Owner's Manual for complete safety precautions and procedures.

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